

Gladden Wind Turbine
Pidgeon Valley Road
Napoli
Cattaraugus County
New York

HAER No. Ny-82

HAER
NY
5-NAP
1-

REDUCED COPIES OF MEASURED DRAWINGS
WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Department of the Interior
Washington, D.C. 20024

HISTORIC AMERICAN ENGINEERING RECORD

NY-82

GLADDEN WIND TURBINE

Date: 1890-1891

Location: Pidgeon Valley Rd. Napoli, Cattaraugus County, NY

Built by: George Gladden

Owned by: Originally; George Gladden
Presently; John Milks

Significance: The Gladden Wind Turbine is a well preserved example of a vertical wind turbine built during the 19th century. Although no longer operational, the turbine (and associated mill structure) is a rare example of wind power technology in the United States

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Form 10-300
(July 1969)UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICENATIONAL REGISTER OF HISTORIC PLACES
INVENTORY - NOMINATION FORM

(Type all entries - complete applicable sections)

STATE: New York	
COUNTY: Cattaraugus	
FOR NPS USE ONLY	
ENTRY NUMBER	DATE
	JUL 15 1973

1. NAME			
COMMON: Milks Windmill			
AND/OR HISTORIC: Gladden Windmill			
2. LOCATION			
STREET AND NUMBER: Pigeon Valley Road			
CITY OR TOWN: Napoli			
STATE: New York	CODE 036	COUNTY: Cattaraugus	CODE 009

3. CLASSIFICATION		CATEGORY (Check One)		OWNERSHIP		STATUS		ACCESSIBLE TO THE PUBLIC	
<input type="checkbox"/> District	<input type="checkbox"/> Building	<input type="checkbox"/> Public	<input type="checkbox"/> Private	<input type="checkbox"/> In Process	<input checked="" type="checkbox"/> Being Considered	<input checked="" type="checkbox"/> Occupied	<input type="checkbox"/> Unoccupied	<input checked="" type="checkbox"/> Yes: Restricted	<input type="checkbox"/> Unrestricted
<input type="checkbox"/> Site	<input checked="" type="checkbox"/> Structure	<input type="checkbox"/> Both				<input type="checkbox"/> Preservation work in progress		<input type="checkbox"/> No	
PRESENT USE (Check One or More as Appropriate)									
<input type="checkbox"/> Agricultural	<input type="checkbox"/> Government	<input type="checkbox"/> Park	<input type="checkbox"/> Transportation	<input type="checkbox"/> Comments					
<input type="checkbox"/> Commercial	<input type="checkbox"/> Industrial	<input type="checkbox"/> Private Residence	<input checked="" type="checkbox"/> Other (Specify)	Storage for					
<input type="checkbox"/> Educational	<input type="checkbox"/> Military	<input type="checkbox"/> Religious	farm						
<input type="checkbox"/> Entertainment	<input type="checkbox"/> Museum	<input type="checkbox"/> Scientific							

4. OWNER OF PROPERTY			
OWNER'S NAME: John Milks			
STREET AND NUMBER: Pigeon Valley Road			
CITY OR TOWN: Napoli	STATE: New York	CODE 036	

5. LOCATION OF LEGAL DESCRIPTION			
COURTHOUSE, REGISTRY OF DEEDS, ETC: Cattaraugus County Courthouse			
STREET AND NUMBER: Little Valley			
CITY OR TOWN: Little Valley	STATE: New York	CODE 036	

6. REPRESENTATION IN EXISTING SURVEYS			
TITLE OF SURVEY: New York State Historic Resources Survey			
DATE OF SURVEY: 1973	<input type="checkbox"/> Federal	<input checked="" type="checkbox"/> State	<input type="checkbox"/> County
DEPOSITORY FOR SURVEY RECORDS: Division for Historic Preservation			
STREET AND NUMBER: South Swan Street Building			
CITY OR TOWN: Albany	STATE: New York	CODE 036	

SEE INSTRUCTIONS

STATE: New York	COUNTY: Cattaraugus	ENTRY NUMBER JUL 15 1973	DATE JUL 15 1973
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7. DESCRIPTION

APR 1958
CONDITION

(Check One)

☐ Excellent ☐ Good ☒ Fair ☐ Deteriorated ☐ Ruins ☐ Unexposed

(Check One)

☒ Altered ☐ Unaltered

(Check One)

☐ Moved ☒ Original Site

DESCRIBE THE PRESENT AND ORIGINAL (If known) PHYSICAL APPEARANCE

The Gladden Milks vertical windmill is a four story wood frame structure built on a stone foundation, with the three lower stories housing the machinery of the mill while a fourth story contains the revolving windwheel. The square portion of the structure below the windwheel has a four foot easterly extension which provides additional storage space. A rectangular one story porch extends from this addition. Both the porch and the windwheel are covered by gable roofs. Board siding with asphalt shingles, in part, covers the exterior walls.

Forming the basis of the interlocking wood frame structural system are "the sills which rest on the masonry walls, the central beam and the center post all of which are hand-hewed beech timbers about 16 inches square." At the building's corners they are fitted and bolted one over the other so that the 12 inch floor joists would rest on the north and south sills and be flush with the top of the east and west sills.

"The corner posts, which support the roof and surround the wind wheel are set at the corners of a 24 foot square. They are hemlock timbers 3 inches square, approximately 88 feet long and extend from the sills below the first floor to the plates supporting the rafters of the roof over the wind wheel. The roof under the windmill which supports the shutters is constructed with rafters which are arranged radially from the wind wheel shaft so located that each rafter supports one of the shutters directly above it. There is also a distinct pitch of this roof downward in all directions from the center to the outside walls. It is covered by heavy tin sheets interlocked and securely nailed in place, with all joints soldered.

"The wind wheel is 11 feet high by 19 feet in diameter and had 16 interior vanes three feet 8 inches wide which were at an angle to the circumference. These have been removed and used as barn siding nearby. The lower arms of the wheel are covered around the circumference with a wooden platform to which the lower ends of the vanes were attached. The upper end of the wheel is completely covered on the underside of the arms with matched lumber to which the upper ends of the vanes were attached. To insure vertical rigidity of the wheel, 1/2 inch steel rods tie the outer ends of the lower wind wheel arms to the inner ends of the upper arms.

¹ The technical information in this statement is quoted from Charles Gladden, "Unique Windmill Erected in 1890's Still Stands," Randolph Register, Volume 99, Number 15, July 4, 1958.

SEE INSTRUCTIONS

continued

NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY - NOMINATION FORM

(Continuation Sheet)

STATE New York	
COUNTY Cattaraugus	
FOR NPS USE ONLY	
ENTRY NUMBER	DATE
	JUL 16 1973

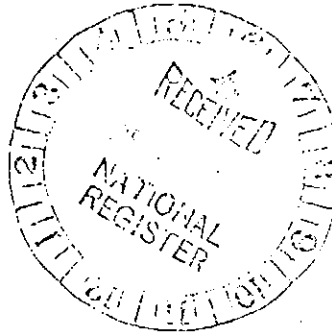
Description

(Number all entries)

page 2

"The 16 shutters surrounding the wheel are of 1-1/4 inch selected matched white pine with an angle at the center of about 157-1/2 degrees so that when closed the outer surface of one shutter will be exactly in line, or in the same plane, with the inner surface of the next adjacent shutter. The shutters are fitted with recessed end castings which are securely attached to the matched lumber with long wood screws.

"The power from the wind wheel was transmitted to the upper shaft by a 24 inch bevel gear attached to the lower end of the vertical wind wheel shaft which engages a 12 inch bevel gear pinion on the horizontal shaft. This shaft was fitted with two wooden pulleys, one 68 inches in diameter which transmitted power to the lower main line shaft and a small pulley for driving the grain elevator."



8. SIGNIFICANCE

PERIOD (Check One or More as Appropriate)

☐ Pre-Columbian☐ 16th Century☐ 18th Century☐ 20th Century☐ 15th Century☐ 17th Century☒ 19th Century

SPECIFIC DATE(S) (If Applicable and Known) 1890

AREAS OF SIGNIFICANCE (Check One or More as Appropriate)

Aboriginal

☐ Prehistoric☐ Historic☒ Agriculture☐ Architecture☐ Art☐ Commerce☐ Communications☐ Conservation☐ Education☒ Engineering☐ Industry☐ Invention☐ Landscape☐ Architecture☐ Literature☐ Military☐ Music☐ Political☐ Religion/Philosophy☐ Science☐ Sculpture☐ Social/Humanitarian☐ Theater☐ Transportation

Urban Planning

Other (Specify)

STATEMENT OF SIGNIFICANCE

A western New York farmer George Gladden seeking to avoid the long journey to the gristmill wondered whether a mill powered by wind would be a feasible reality on his farm. His attempt to answer this question produced a significant piece of industrial architecture, a vertical windmill, uncommon in its design and perhaps otherwise disappeared in the United States.

The unique features of this windmill include the design of the windwheel and the shutters surrounding it. The wind from one side is directed into the wheel by the open shutters, while simultaneously the wind on the other side is directed away from the wheel. As the wind enters it presses against the vanes with considerable force and after passing across the wheel it exerts another force across the vanes as it leaves. Hence the vertical wheel revolves, and with a wind of 20 or 25 miles it could produce 20 horsepower.

Gladden initially had seen the prototype for his windmill near Lincoln, Nebraska in 1888 while visiting relatives. He immediately acquired the rights to build such a mill and purchased the necessary iron parts, and gears. In the fall of 1890 the basement for the structure was excavated and the foundation laid. A year later the mill was completed.

What Gladden had seen in Nebraska may have been what was recorded in the U. S. Patent Office "Official Gazette" on March 19, 1888, patent No. 387424. A patent was awarded to Bernhard Koeppe of Kearney, Nebraska for a windmill similar in design to Gladden's. The primary difference was that in Koeppe's design the 16 shutters are straight or flat instead of having an angle at the center. Koeppe's wind wheel had eight vanes with a sharp angle at the center instead of the 16 flat vanes Gladden employed. It is probable that the mill built by Gladden was a simplification or variation of the one patented by Koeppe.

Gladden originally equipped his mill with machinery for elevating and grinding grain, an apple grater and press for making cider, a wood turning lathe, and a shop for general

Continued

SEE INSTRUCTIONS

NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY - NOMINATION FORM

STATE New York	
COUNTY Cattaraugus	
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ENTRY NUMBER	DATE JUL 10 1973

Significance

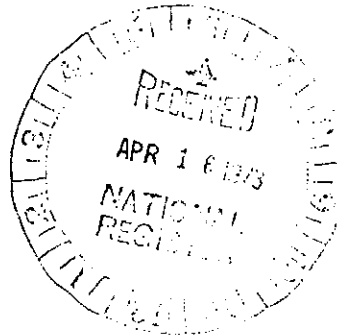
(Continuation Sheet)

(Number all entries)

repair work. The grain grinding was done on Edward Harrison's "Standard Mill" manufactured in New Haven, Connecticut. Cider making equipment was purchased from the Boomer and Boschert Press Company of Syracuse. Another purchase was a grinder so designed that the grain was fed upward by centrifugal force to the grinding plates. Gladden discovered this device at the 1893 World's Fair in Chicago.

Gladden's vertical windmill, while no longer operational is largely intact with the exception of the vanes which have been removed. It remains as a unique structure and as the ingenious answer to one farmer's search for convenience and increased productivity.

see Charles Gladden, "Unique Windmill..."



9. MAJOR BIBLIOGRAPHICAL REFERENCES

Gladden, Charles, "Unique Windmill Erected in 1890's still Stands," Randolph Register, Volume 99, Number 15, July 4, 1958.

Newsletter, Society for Industrial Archeology, Volume one Number 6, Nov., 1972, p. 2.

10. GEOGRAPHICAL DATA

LATITUDE AND LONGITUDE COORDINATES DEFINING A RECTANGLE LOCATING THE PROPERTY			O R	LATITUDE AND LONGITUDE COORDINATES DEFINING THE CENTER POINT OF A PROPERTY OF LESS THAN TEN ACRES		
CORNER	LATITUDE	LONGITUDE		LATITUDE	LONGITUDE	
	Degrees Minutes Seconds	Degrees Minutes Seconds		Degrees Minutes Seconds	Degrees Minutes Seconds	
NW	° ' "	° ' "		42 ° 14' 06"	78 ° 53' 45"	
NE	° ' "	° ' "				
SE	° ' "	° ' "				
SW	° ' "	° ' "				

APPROXIMATE ACREAGE OF NOMINATED PROPERTY: less than one acre

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE:	CODE	COUNTY:	CODE
STATE:	CODE	COUNTY:	CODE
STATE:	CODE	COUNTY:	CODE
STATE:	CODE	COUNTY:	CODE

11. FORM PREPARED BY

NAME AND TITLE:		DATE	
<u>Steven S. Levy</u>		<u>3/30/73</u>	
ORGANIZATION			
<u>New York State Division of Historic Preservation</u>			
STREET AND NUMBER:			
<u>South Swan Street Building</u>			
CITY OR TOWN:		STATE	CODE
<u>Albany</u>		<u>New York</u>	<u>036</u>

12. STATE LIAISON OFFICER CERTIFICATION

NATIONAL REGISTER VERIFICATION

As the designated State Liaison Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service. The recommended level of significance of this nomination is:

National ☒ State ☐ Local ☐

Name [Signature]

Title State Liaison Officer

Date 4/11/73

I hereby certify that this property is included in the National Register.

[Signature]
Chief, Office of Archeology and Historic Preservation

Date 7/16/73

ATTEST:

[Signature]
Keeper of The National Register

Date 7 9 73

SEE INSTRUCTIONS